

PCT BRANCH

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: WALKER, Gerald, et al

Int'l Appln. No.: PCT/US04/02712

Int'l Filing Date: January 30, 2004

For: COMPOSITE MATERIAL HAVING THE APPEARANCE OF NATURAL STONE

Docket No: F178822

WRITTEN REPLY

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Written Reply is in response to the Written Opinion of the International Preliminary Examination Authority (IPEA) mailed August 18, 2004 by the International Searching Authority (ISA). Since a demand for international preliminary examination is filed concurrently herewith, the Written Opinion of the ISA is considered to be a Written Opinion of the IPEA. This Written Reply is due on or before May 11, 2005, which is 22 months from the priority date of July 11, 2003.

REMARKS

Claims 1-65 are pending in the application.

Claims 1-24 and 26-65 have been amended.

A copy of replacement pages 24-28, 28/1 and 29-33 is submitted herewith.

Claims 21 and 59 are amended to recite that the antimicrobial agent "comprises" silver as opposed to "contains" silver, to use more appropriate patent claim language.

All of the amendments made to the claims are stylistic or formal in nature. No new matter has been added. These amendments are further described below.

I. Response to Examiner's Statement Regarding Novelty, Inventive Step and Industrial Applicability

The Written Opinion indicates that all of claims 1-65 are Novel, and have the requisite Industrial Applicability. Further the Examiner finds that claims 14-18 and 52-56 have an Inventive Step.

However, the Written Opinion states that claims 1-13, [19]-51 and 57-65 lack an Inventive Step over Yamanashi *et al.* (U.S. Application Publication No : 2003/0087074, published May 8, 2003, filed October 3, 2001) alone or in view of Cuffaro (U.S. Patent 3,670,060), Mangrum (U.S. Patent 3,278,662), Slocum (U.S. Patent 5,321,055), Sakai (U.S. Patent 6,136,226), Brubaker (U.S. Patent 4,595,626), Charlebois (U.S. Patent 5,800,752), or Wilkinson (U.S. Patent 6,387,985).

Applicants respectfully disagree with the Examiner regarding an alleged lack of inventive step for claims 1-13, [19]-51 and 57-65. Nevertheless, Applicants defer further consideration on the issue of inventive step until National Phase examination.

II. Response to Certain Observations on the International Application

The Written Opinion indicates that claims 1-65 are objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because the claims are indefinite.

First, the Written Opinion contends that claims 1 and 28 are unclear as to the types of natural aggregates, polymeric binders, curing agents and antimicrobial agents encompassed by the claims.

Applicants respectfully disagree and believe that claims 1 and 28 should be interpreted in light of the specification. Applicants request that the Examiner explain more particularly how, in view of the specification, claims 1 and 28 are unclear.

Second, the Written Opinion contends that, in claim 2, the phrase "said natural aggregate material" lacks proper antecedent basis.

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Applicants have removed the term "material" making the language of claim 2 consistent with independent claim 1. Thus, Applicants believe that amended claim 2 is clear.

Third, the Written Opinion contends that, in claim 4, the phrase "total composition" lacks proper antecedent basis in the claims.

Applicants have replaced the term "total composition" with "composite material" making the language of claim 4 consistent with the language of independent claim 1. Thus, Applicants believe that amended claim 4 is clear.

Fourth, the Written Opinion contends that, in claim 30, the phrase "the natural aggregate material" lacks proper antecedent basis.

Applicants have removed the term "material" making the language of claim 30 consistent with claim 29. Thus, Applicants believe that amended claim 30 is clear.

Finally, Applicants have amended the claims for consistent usage of terms.

In view of the above, Applicants respectfully request that the Examiner's objections to the claims as lacking clarity be withdrawn.

III. Conclusion

In view of the above, a favorable International Preliminary Examination Report with regard to claims 1-65 in the International Application is respectfully requested.

Respectfully submitted,

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Claims

1. (Amended) A composite material having an appearance similar to that of natural stone, said material comprising:
 - a natural aggregate,
 - a polymeric binder,
 - a curing agent, and
 - an antimicrobial agent.
2. (Amended) The composite material according to claim 1 wherein said natural aggregate is selected from the group consisting of calcium carbonate, marble, granite, quartz, feldspar, marble and quartzite and mixtures thereof.
3. (Amended) The composite material according to claim 2 further comprising a filler selected from the group consisting of fumed silica, sand, clay, fly ash, cement, broken ceramics, mica, silicate flakes, broken glass, glass beads, glass spheres, mirror fragments, steel grit, aluminum grit, carbides, plastic beads, pelletized rubber, ground polymer composites, wood chips, sawdust, paper laminates, pigments, colorants, and mixtures thereof.
4. (Amended) The composite material according to claim 2 wherein said natural aggregate makes up between about 85% to about 96% by weight of the composite material.
5. (Amended) The composite material according to claim 4 wherein said natural aggregate makes up between about 89% to about 93% by weight of the composite material.
6. (Amended) The composite material according to claim 4 wherein the polymeric binder makes up between about 4% to about 15% by weight of the composite material.

7. (Amended) The composite material according to claim 6 wherein said polymeric binder makes up between about 6% to about 10% by weight of the composite material.

8. (Amended) The composite material according to claim 1 wherein said polymeric binder is selected from the group consisting of monomers, a mixture of monomers, polymers, a mixture of polymers, and a mixture of monomers and polymers.

9. (Amended) The composite material according to claim 8 wherein said polymeric binder is a polymer and is selected from the group consisting of thermoplastic polymers and thermosetting polymers.

10. (Amended) The composite material according to claim 9 wherein said polymeric binder is a polymer and is selected from the group consisting of polyester, vinyl ester, epoxy, phenolic resin, urethane, and mixtures thereof.

11. (Amended) The composite material according to claim 8 wherein said polymeric binder is a monomer and is selected from the group consisting of acrylics, styrene, styrene derivatives, vinyl toluene, divinyl benzene, methyl acrylate, ethyl acrylate, isopropyl acrylate, butyl acrylate, 2-ethylhexyl acrylate, methyl methacrylate, ethyl methacrylate, isopropyl methacrylate, butyl methacrylate, phenols, and furans.

12. (Amended) The composite material according to claim 11 wherein said monomer is selected from the group consisting of styrene, methyl methacrylate and butyl acrylate.

13. (Amended) The composite material according to claim 1 wherein said antimicrobial agent is selected from the group consisting of organic and inorganic antimicrobial agents.

14. (Amended) The composite material according to claim 13 wherein said antimicrobial agent is organic and is present in said composite material in a quantity between about 500 ppm and 10,000 ppm.

15 (Amended) The composite material according to claim 14 wherein said antimicrobial agent is organic and is present in said composite material in a quantity between about 800 ppm and 7000 ppm.

16 (Amended) The composite material according to claim 14 wherein said antimicrobial agent is organic and is selected from the group consisting of quarternary ammonium compounds, quarternary ammonium compounds having an unsaturated reactive group, metals, and antimicrobial agents exhibiting the ability to migrate through said polymeric binder..

17. (Amended) The composite material according to claim 16 wherein said antimicrobial agent is selected from the group consisting of triclosan, tolyl diiodomethyl sulfone, zinc pyrithione, sodium pyrithione, ortho phenylphenol, sodium ortho phenylphenol, iodo2-propynyl butylcarbamate, poly [oxyethylene(dimethyliminio) ethylene(dimethyliminio)ethylene chloride], propiconazole, tebuconazole, bethoxazin, thiabendazole, polyhexamethylene biguanide, 1,3,5-triazine-1,3,5(2H,4H,6H)-triethanol, isothiazalinones, and mixtures thereof.

18. (Amended) The composite material according to claim 17 wherein the polymeric binder is polyester and said antimicrobial agent is triclosan, wherein said triclosan is present in the composite material in a quantity between about 800 ppm and 5000 ppm.

19. (Amended) The composite material according to claim 13 wherein said antimicrobial agent is an inorganic agent and is selected from the group consisting of metal salts, ceramics containing metals, zeolites containing metals, and mixtures thereof.

20. (Amended) The composite material according to claim 19 wherein said antimicrobial agent is selected from the group consisting of salts of silver, copper, zinc, mercury, tin, lead, bismuth, barium, cadmium, and mixtures thereof.

21. (Amended) The composite material according to claim 20 wherein said antimicrobial agent comprises silver and is selected from the group consisting of silver acetate, silver benzoate, silver carbonate, silver iodate, silver iodide, silver lactate, silver laurate, silver nitrate, silver oxide, silver palmitate, silver sulfadiazine, ceramics containing silver, zeolites containing silver, and mixtures thereof

22. (Amended) The composite material according to claim 19 wherein said antimicrobial agent is present in the composite material in a concentration between about 1000 ppm and 50,000 ppm.

23. (Amended) The composite material according to claim 21 wherein the binder is polyester and said antimicrobial agent is present in the composite material in a concentration between about 1000 ppm and 50,000 ppm.

24. (Amended) The composite material according to claim 1 wherein said antimicrobial agent is present in an amount sufficient to demonstrate commercially acceptable efficacy against a microbe of concern.

25. A finished product comprising the composite material according to claim 1.

26. (Amended) The finished product according to claim 25 selected from the group consisting of a tabletop, a countertop, architectural facings, walkways, home furnishings, patio furniture, decorative stone, indoor and outdoor tile, flooring, mantles, wall facings, bathroom fixtures, and imitation stone structures.

27. (Amended) The composite material according to claim 1 further comprising a colorant.

28. (Amended) A process for manufacturing a composite material, said process comprising the steps of:

obtaining a natural aggregate of appropriate dimension;

combining said natural aggregate with a polymeric binder to form an aggregate and binder mixture;

adding an antimicrobial agent to said aggregate and binder mixture;

distributing said aggregate and binder mixture comprising antimicrobial agent in a mold; and

curing said aggregate and binder mixture comprising antimicrobial agent by application of heat and pressure and vibration.

29. (Amended) The process according to claim 28 wherein said natural aggregate is combined with said polymeric binder in a quantity such that it makes up between about 85% to about 96% by weight of said aggregate and binder mixture

30. (Amended) The process according to claim 29 wherein said natural aggregate makes up between about 89% to about 93% by weight of the composite material

31. (Amended) The process according to claim 28 wherein the step of obtaining the natural aggregate comprises obtaining a natural aggregate selected from the group consisting of calcium carbonate, quartz, granite, feldspar, marble, quartzite, and mixtures thereof

32. (Amended) The process according to claim 31 further comprising the step of combining the aggregate with a filler selected from the group consisting of fumed silica, sand, clay, fly ash, cement, broken ceramics, mica, silicate flakes, broken glass, glass beads, glass spheres, mirror fragments, steel grit, aluminum grit, carbides, plastic beads, pelletized rubber, ground polymer composites, wood chips, sawdust, paper laminates, pigments, colorants, and mixtures thereof

33. (Amended) The process according to claim 31 wherein said natural aggregate is selected from the group consisting of granite, marble, quartz and mixtures thereof.

34. (Amended) The process according to claim 28 wherein said polymeric binder is combined with said natural aggregate in a quantity such that said polymeric binder makes up between about 4% to about 15% by weight of said aggregate and binder mixture.

35. (Amended) The process according to claim 34 wherein said polymeric binder makes up between about 6% to about 10% by weight of said aggregate and binder mixture.

36. (Amended) The process according to claim 28 wherein said polymeric binder is selected from the group consisting of monomers, a mixture of monomers, polymers, a mixture of polymers, and a mixture of monomers and polymers.

37. (Amended) The process according to claim 28 wherein said polymeric binder is a polymer and is selected from the group consisting of thermoplastic polymers and thermosetting polymers.

38. (Amended) The process according to claim 37 wherein said polymeric binder is a polymer and is selected from the group consisting of polyester, vinyl ester, epoxy, phenolic resin, urethane, and mixtures thereof.

39. (Amended) The process according to claim 36 wherein said polymeric binder is a monomer and is selected from the group consisting of styrene, styrene derivatives, vinyl toluene, divinyl benzene, methyl acrylate, ethyl acrylate, isopropyl acrylate, butyl acrylate, 2-ethylhexyl acrylate, methyl methacrylate, ethyl methacrylate, isopropyl methacrylate, butyl methacrylate, phenols, and furans.

40. (Amended) The process according to claim 39 wherein said monomer is selected from the group consisting of styrene, methyl methacrylate and butyl acrylate.

41. (Amended) The process according to claim 34 wherein said polymeric binder is polyester.

42. (Amended) The process according to claim 28 further comprising the step of placing the aggregate and binder mixture under a vacuum

43. (Amended) The process according to claim 42 wherein the vacuum is maintained as said aggregate and binder mixture is distributed into the mold.

44. (Amended) The process according to claim 28 wherein the step of curing the mixture under pressure comprises application of a vacuum.

45. (Amended) The process according to claim 42 wherein the curing step comprises application of heat between ambient and about 200°C.

46. (Amended) The process according to claim 28 wherein the applied pressure is between about 70 tons and about 140 tons.

47. (Amended) The process according to claim 28 wherein the step of adding an antimicrobial agent to said aggregate and binder mixture comprises adding said antimicrobial agent directly to said aggregate and binder mixture.

48. (Amended) The process according to claim 28 wherein the step of adding the antimicrobial agent to said aggregate and binder mixture comprises adding said antimicrobial agent to said polymeric binder prior to combining the natural aggregate with the polymeric binder.

49. (Amended) The process according to claim 28 wherein the step of adding the antimicrobial agent to said aggregate and binder mixture comprises combining said antimicrobial agent with a colorant and then adding said antimicrobial agent and colorant to said aggregate and binder mixture.

50. (Amended) The process according to claim 28 wherein the step of adding the antimicrobial agent comprises adding said antimicrobial agent to a polymeric layer adjacent an outer surface of the cured mixture.

51. (Amended) The process according to claim 28 wherein the antimicrobial agent is selected from the group consisting of organic and inorganic agents.

52. (Amended) The process according to claim 51 wherein the antimicrobial agent is organic and is added in an amount sufficient to constitute between about 500 ppm and 10,000 ppm of said aggregate and binder mixture.

53. (Amended) The process according to claim 52 wherein the antimicrobial agent is organic and is added in an amount of between about 800 ppm and 7000 ppm of said aggregate and binder mixture.

54. (Amended) The process according to claim 52 wherein the antimicrobial agent is an organic antimicrobial agent and is selected from the group consisting of quarternary ammonium compounds, quarternary ammonium compounds having an unsaturated reactive group, metals, and organic antimicrobial agents exhibiting the ability to migrate through said polymeric binder, and mixtures thereof.

55. (Amended) The process according to claim 54 wherein the antimicrobial agent is selected from the group consisting of triclosan, tolyl diiodomethyl sulfone, zinc pyrithione, sodium pyrithione, ortho phenylphenol, sodium ortho phenylphenol, iodo-2-propynyl butylcarbamate, poly[oxyethylene(dimethylimino) ethylene(dimethylimino)ethylene chloride], propiconazole, tebuconazole, bethoxazin, thiabendazole, polyhexamethylene biguanide, 1,3,5-triazine-1,3,5-(2H,4H,6H)-triethanol, isothiazalinones and mixtures thereof.

56. (Amended) The process according to claim 55 wherein the polymeric binder is polyester and the antimicrobial agent is triclosan, wherein the triclosan is present in the composite material in a quantity between about 800 ppm and 5000 ppm.

57. (Amended) The process according to claim 51 wherein the antimicrobial agent is an inorganic agent and is selected from the group consisting of metal salts, ceramics containing metals, zeolites containing metals, and mixtures thereof.

58. (Amended) The process according to claim 57 wherein the antimicrobial agent is selected from the group consisting of salts of silver, copper, zinc, mercury, tin, lead, bismuth, barium, cadmium, chromium, and mixtures thereof.

59. (Amended) The process according to claim 58 wherein the antimicrobial agent comprises silver and is selected from the group consisting of silver acetate, silver benzoate, silver carbonate, silver iodate, silver iodide, silver lactate, silver laurate, silver nitrate, silver oxide, silver palmitate, silver sulfadiazine, ceramics containing silver, zeolites containing silver, and mixtures thereof.

60. (Amended) The process according to claim 57 wherein said antimicrobial agent is added to the mixture to constitute a concentration between about 1000 ppm and 50,000 ppm of said mixture.

61. (Amended) The process according to claim 59 wherein said polymeric binder is polyester and said antimicrobial agent is present in the composite material in a concentration between about 1000 ppm and 50,000 ppm.

62. (Amended) The process according to claim 51 wherein said antimicrobial agent is present in an amount sufficient to demonstrate commercially acceptable efficacy against a microbe of concern.

63. (Amended) The process according to claim 28 wherein said polymeric binder comprises a polyester and said antimicrobial agent is triclosan and the triclosan present in the cured mixture is between about 800 ppm and about 5000 ppm based upon the weight of the cured mixture.

64. (Amended) The process according to claim 28 further comprising forming a finished product from the cured mixture.

65. (Amended) The process according to claim 64 wherein the step of forming a finished product comprises forming a tabletop, a countertop, architectural facings, walkways, home furnishings, patio furniture, decorative stone, indoor and outdoor tile, flooring, mantles, wall facings, bathroom fixtures, cutting boards, sinks, showers, tubs, and imitation stone structures.